

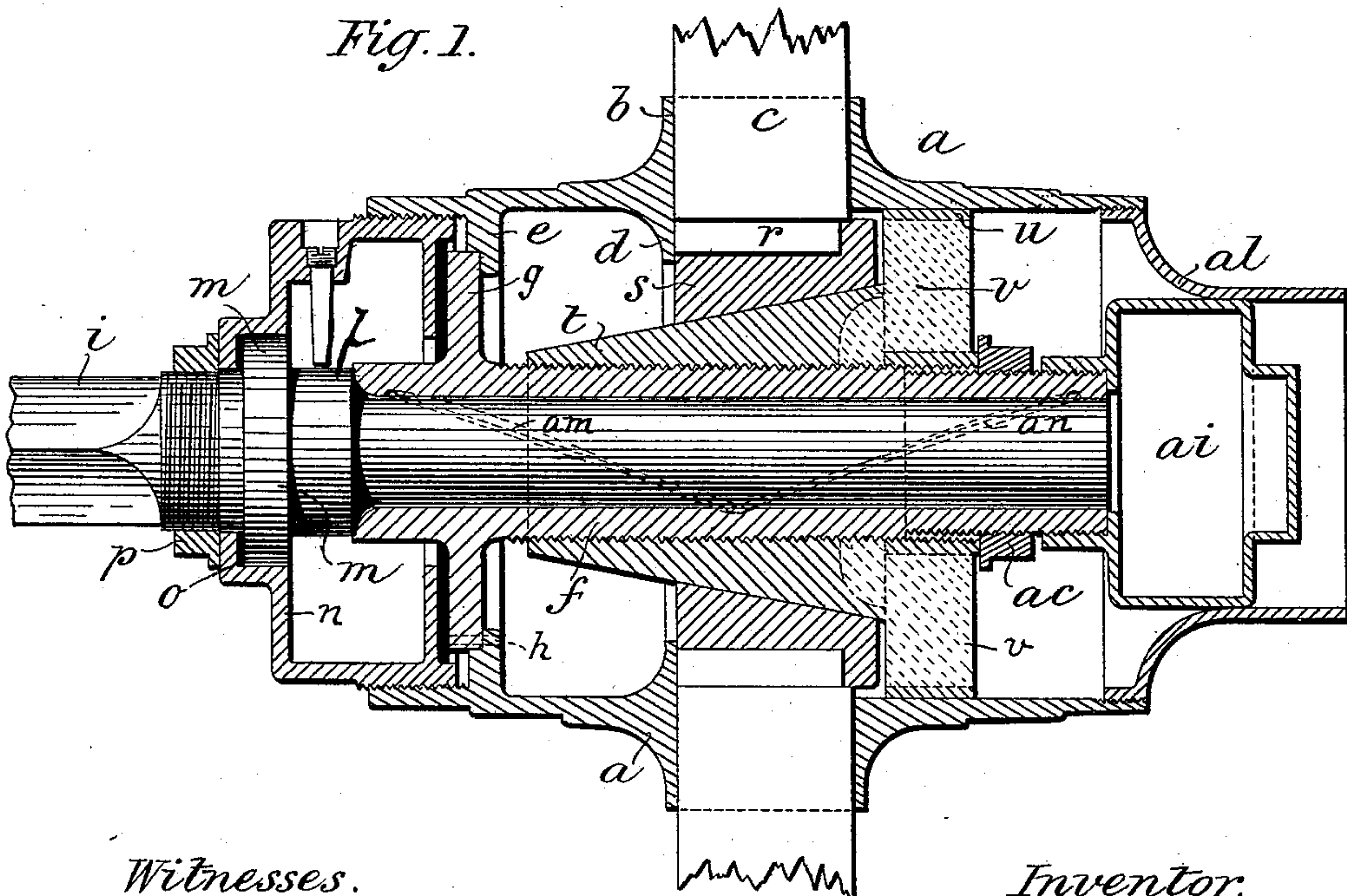
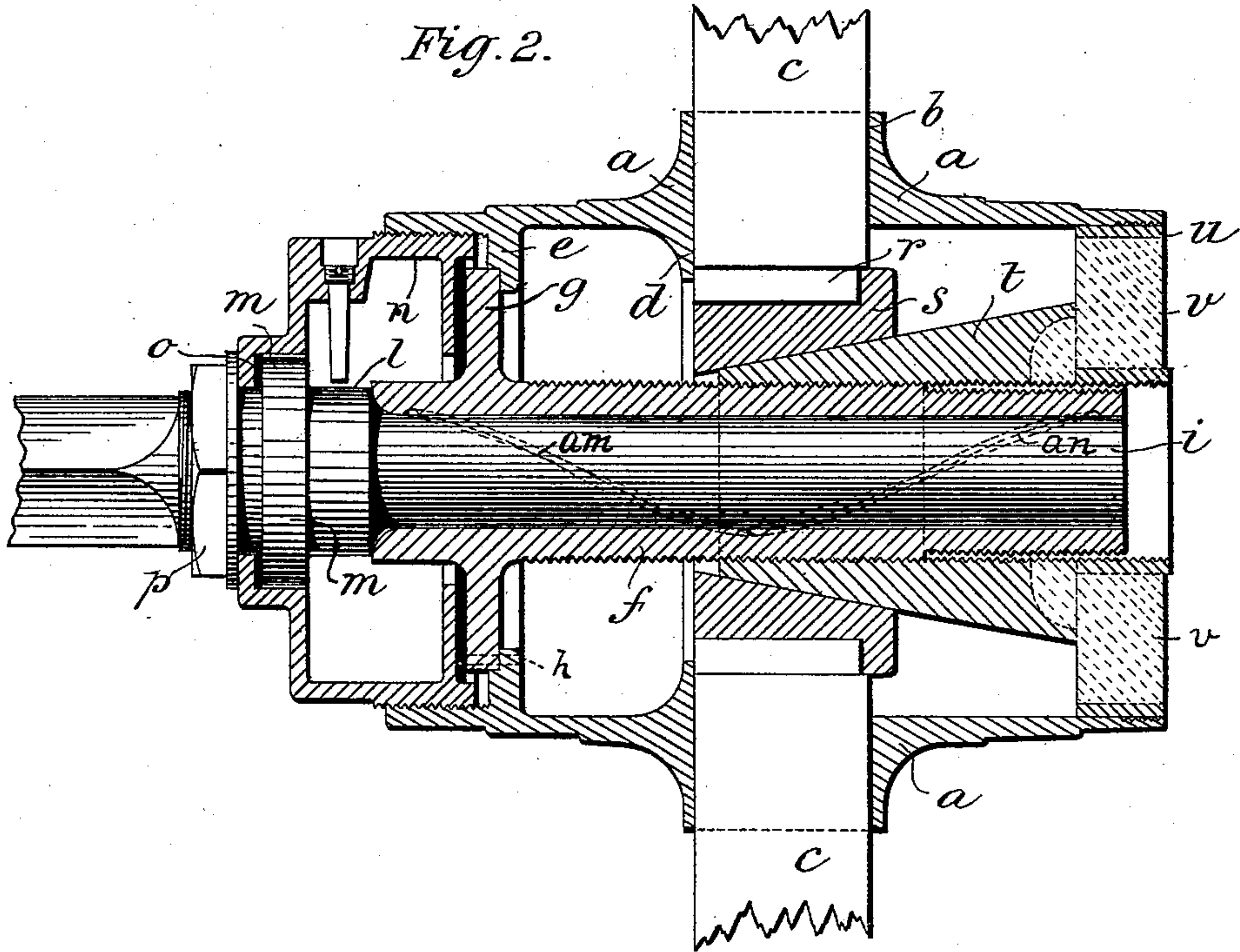
(No Model.)

4 Sheets—Sheet 1.

H. MOORE.
WHEEL FOR ROAD VEHICLES.

No. 529,077.

Patented Nov. 13, 1894.



Witnesses.
Albert Jones.
John F. Gairns.

Inventor.
Harvey Moore
By his Attorneys.
Wheatley & Mackenzie

(No Model.)

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Fig. 4.

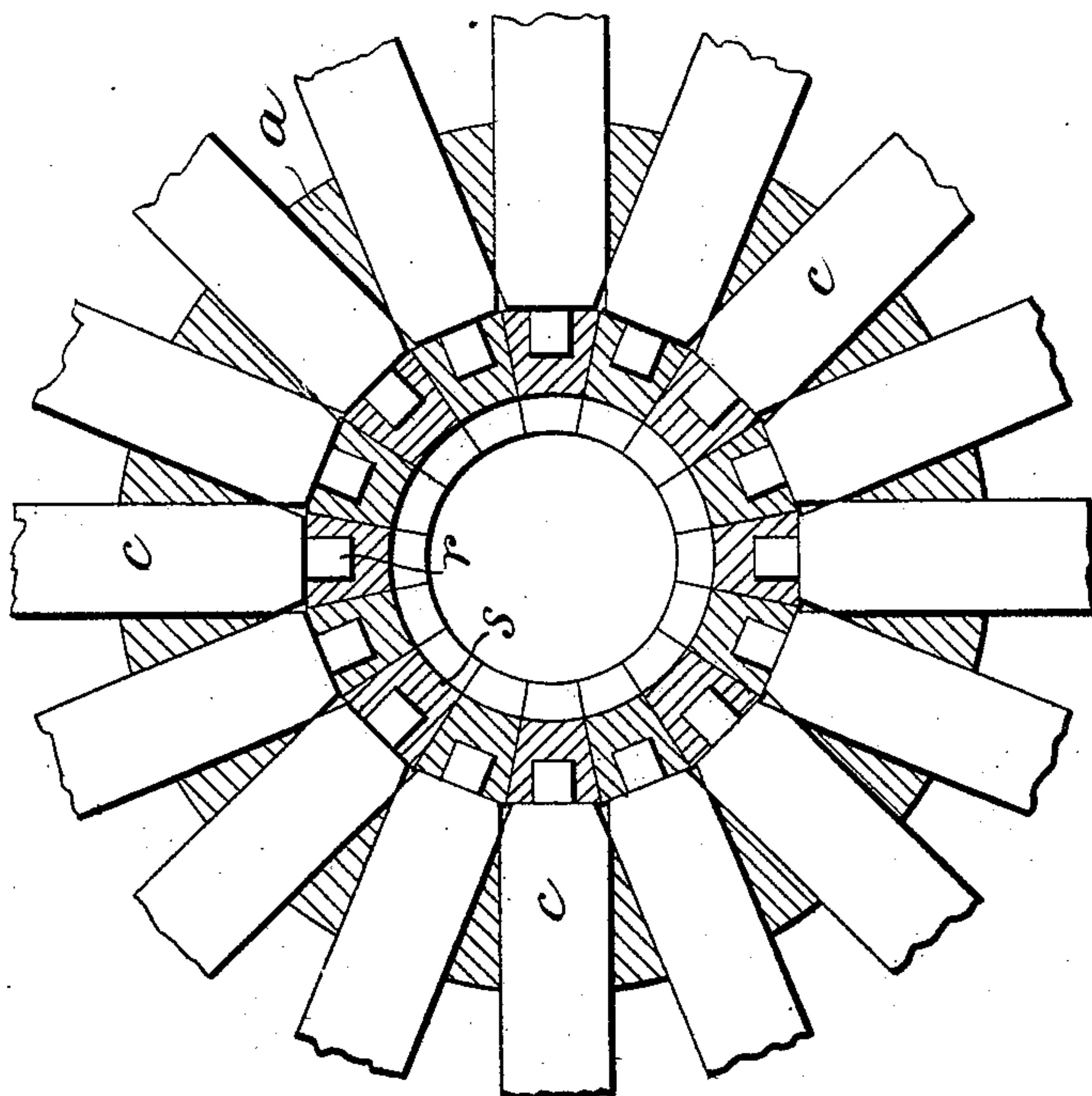
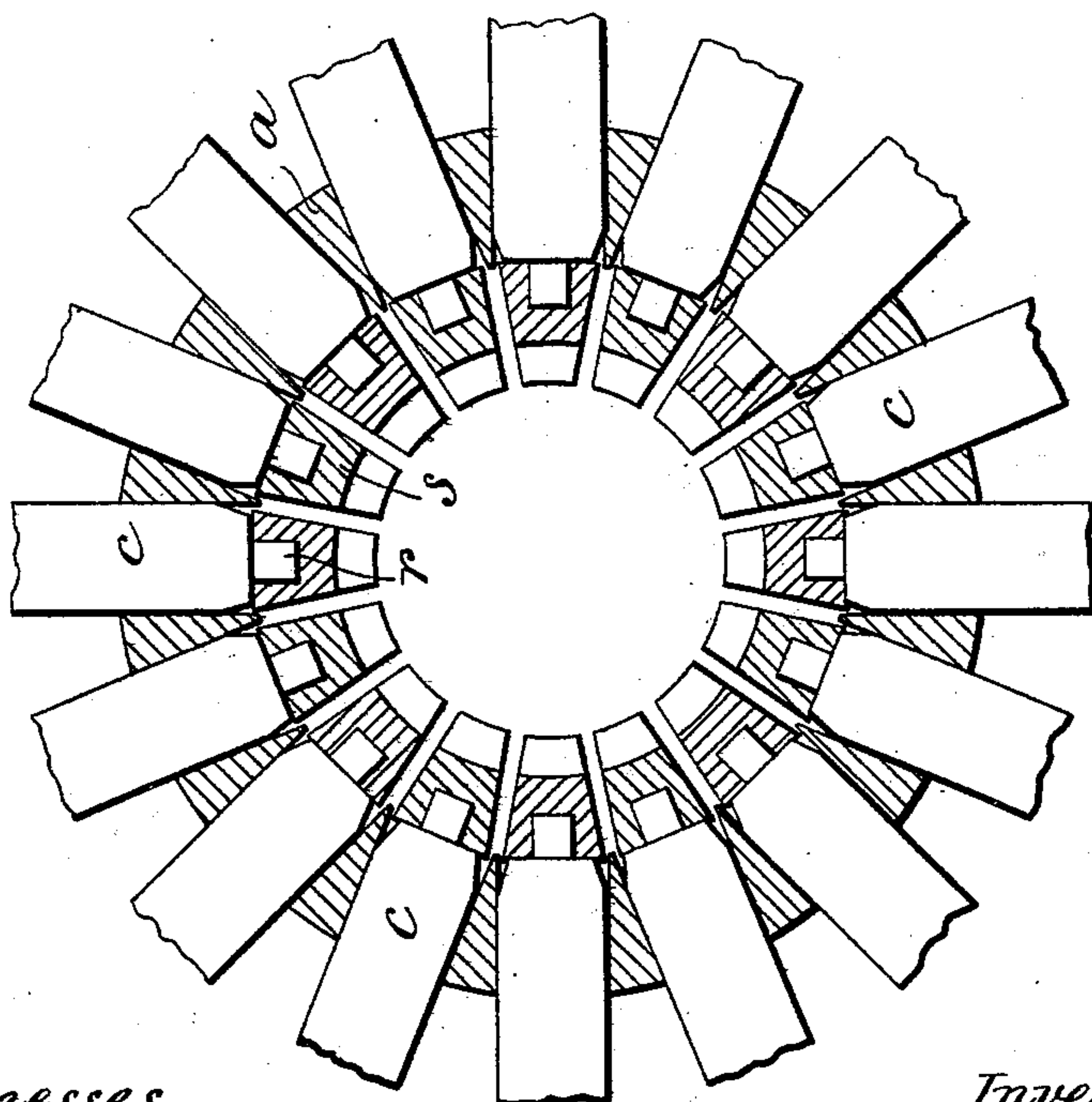


Fig. 3.



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Fig. 5.

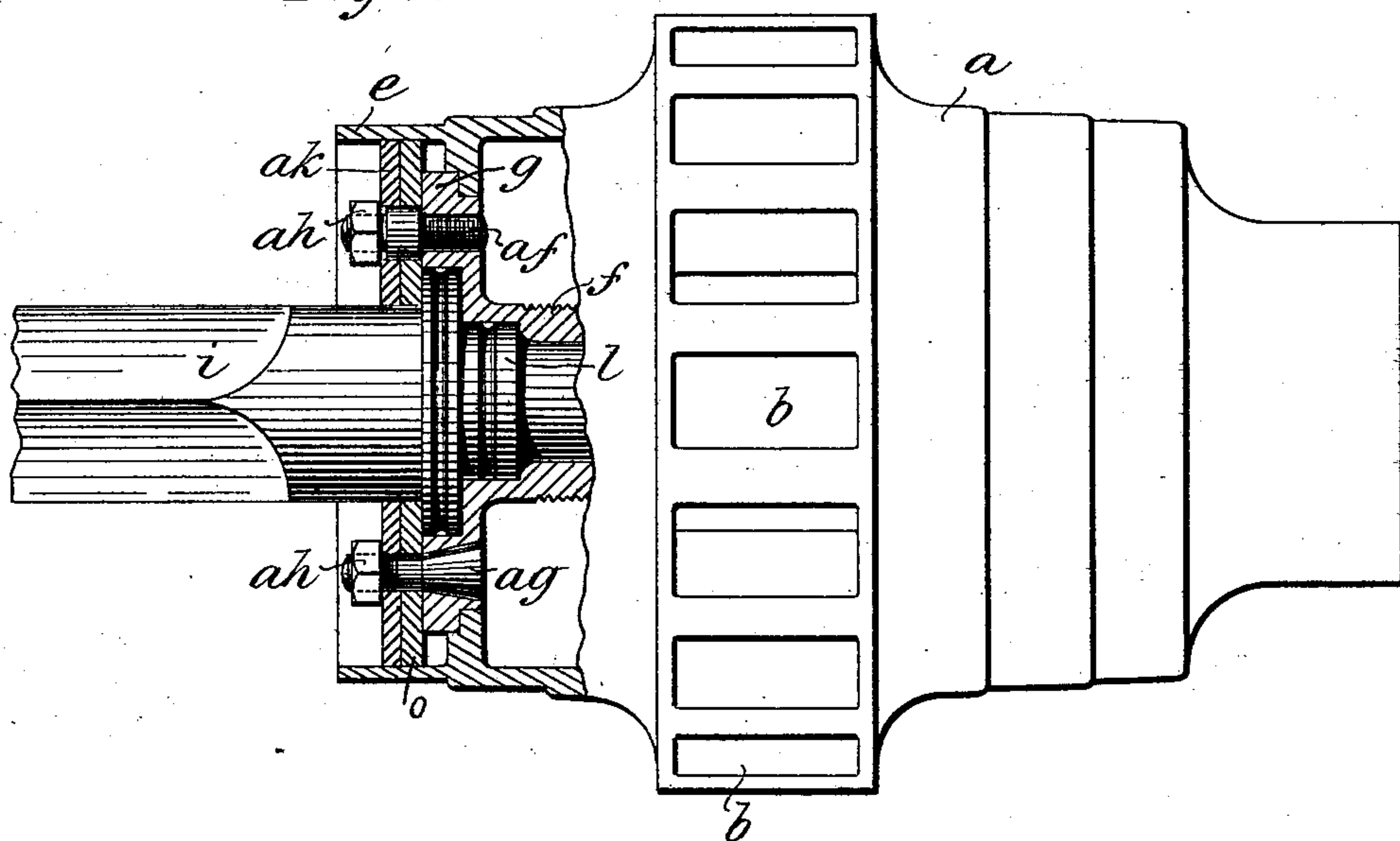


Fig. 6.

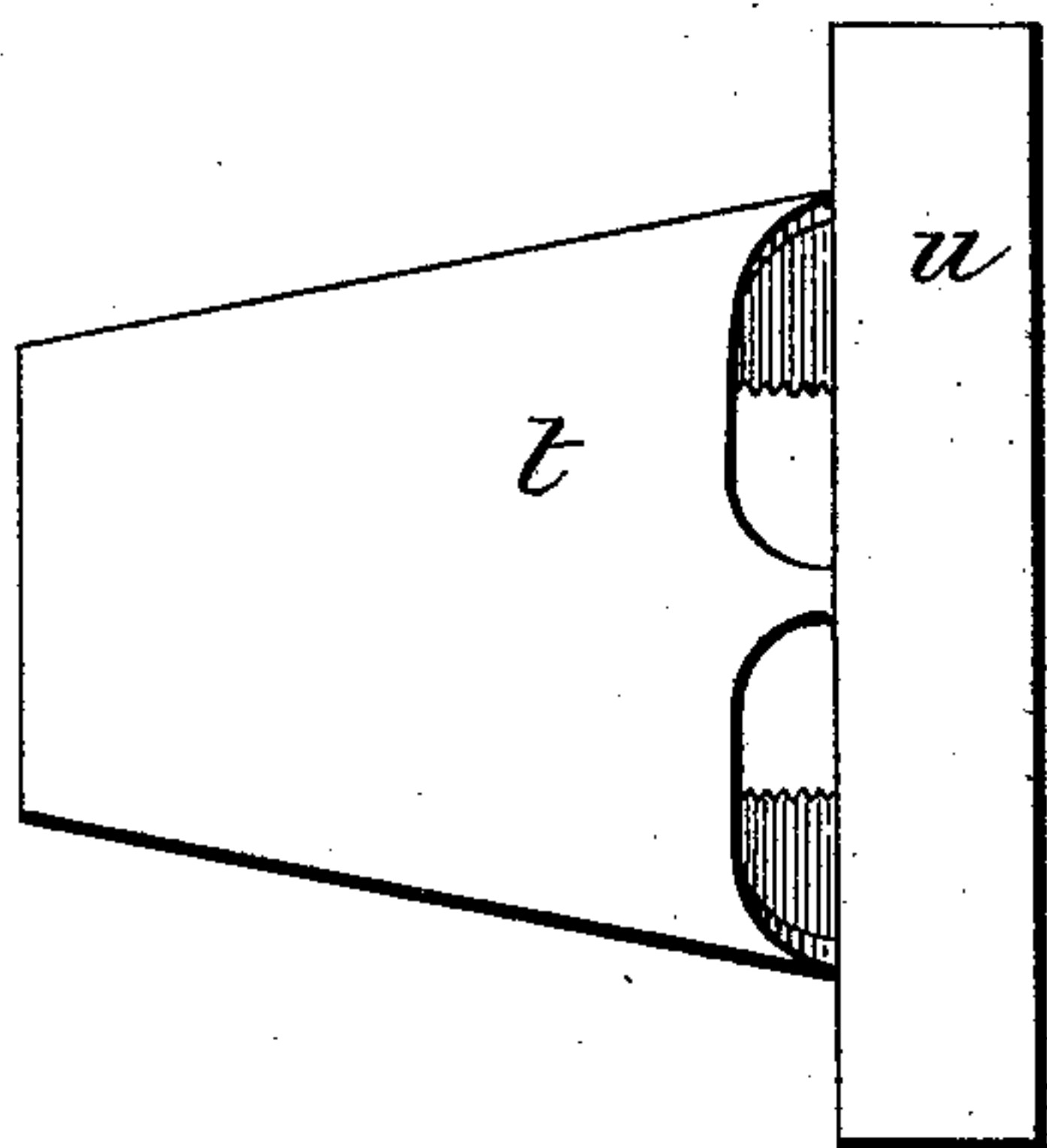


Fig. 7.

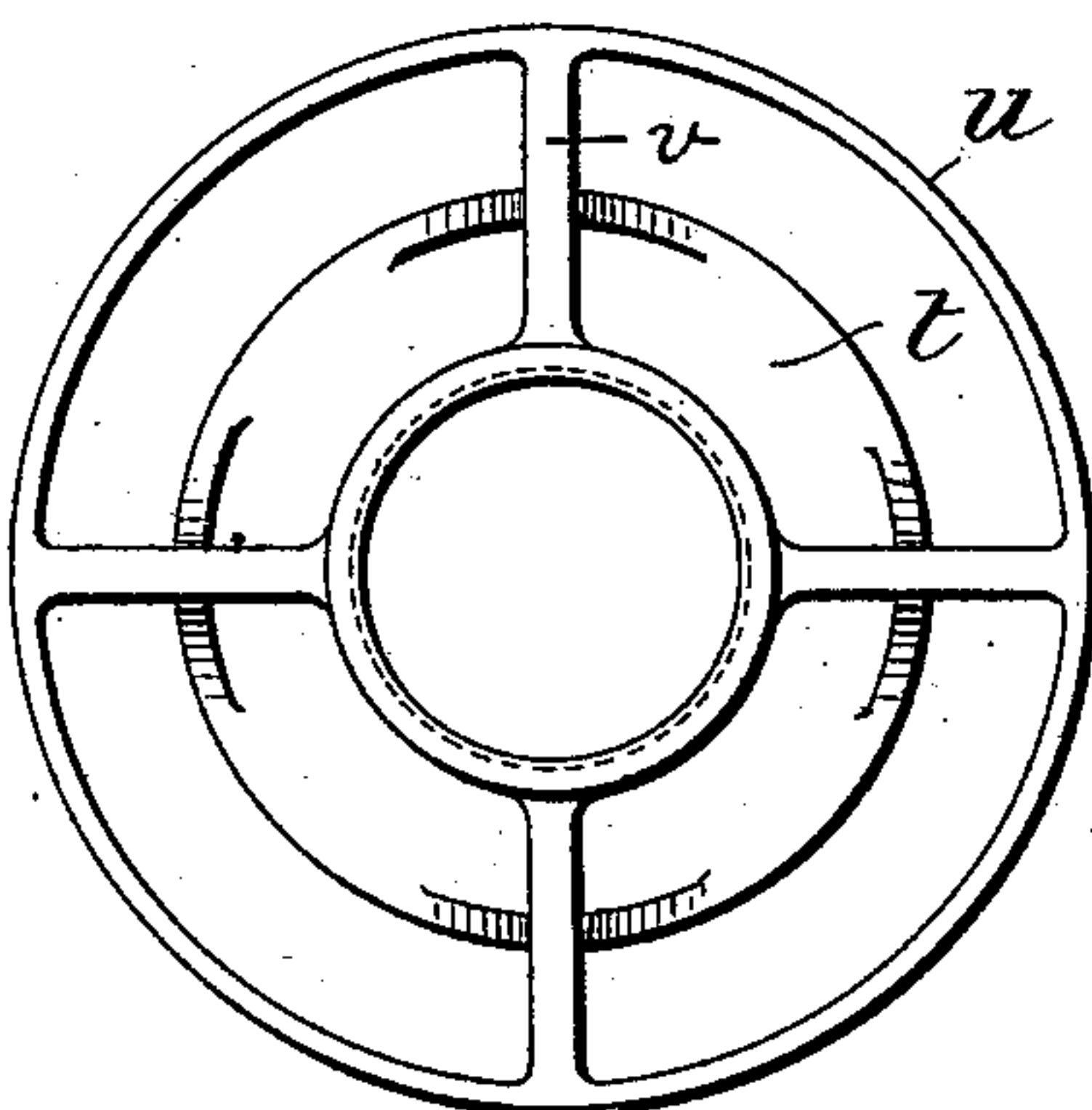


Fig. 8.

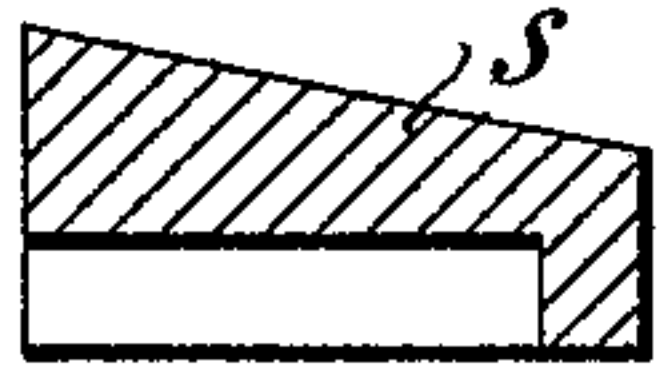


Fig. 9.

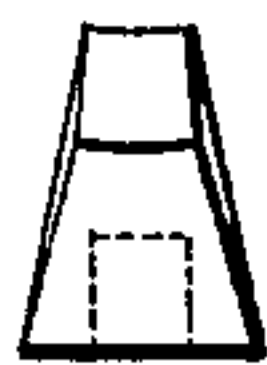


Fig. 11.

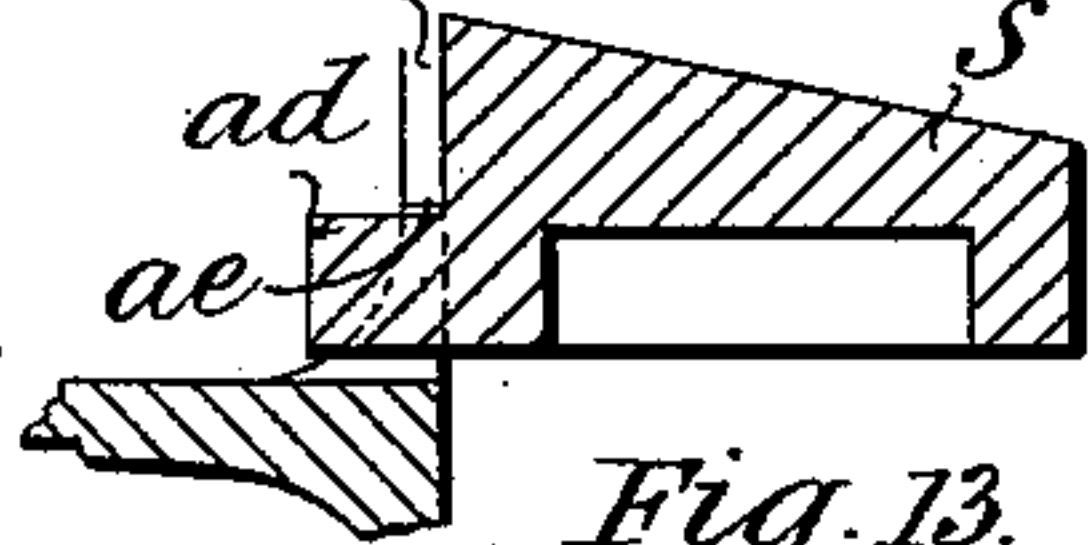


Fig. 12.



Fig. 14.

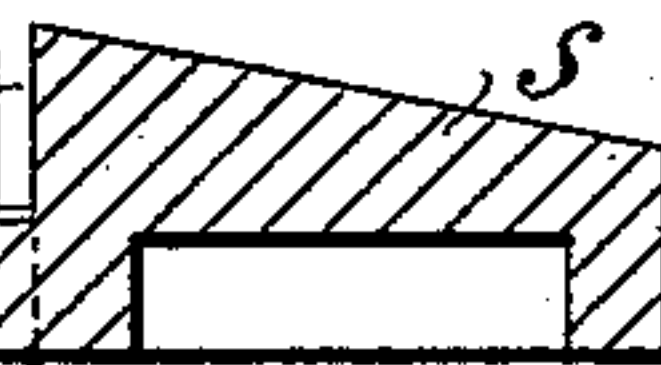


Fig. 15.



Fig. 10.

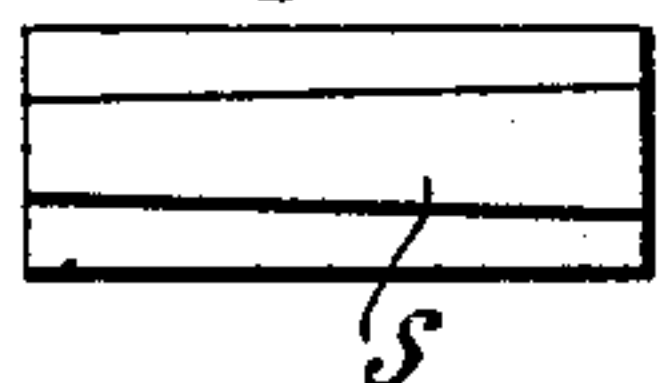


Fig. 13.

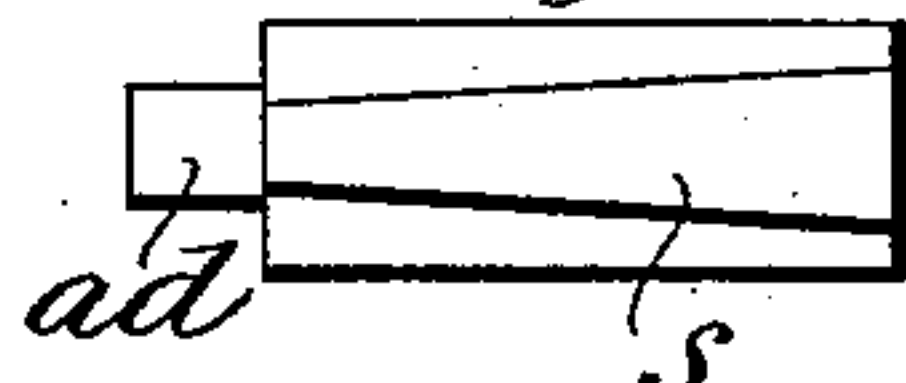
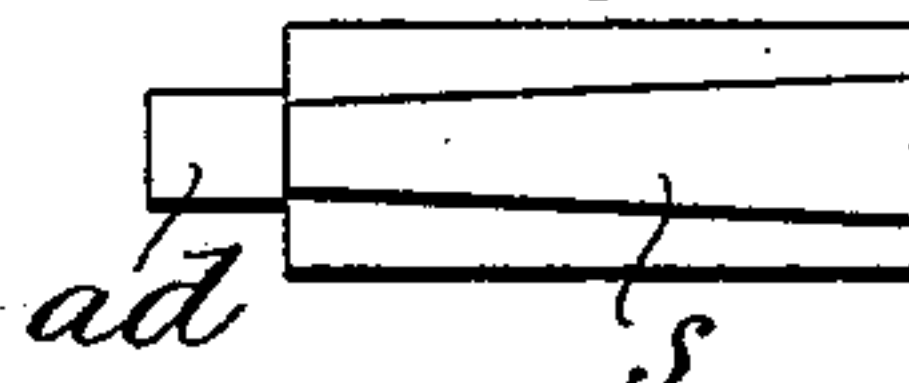


Fig. 16.



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Fig. 18.

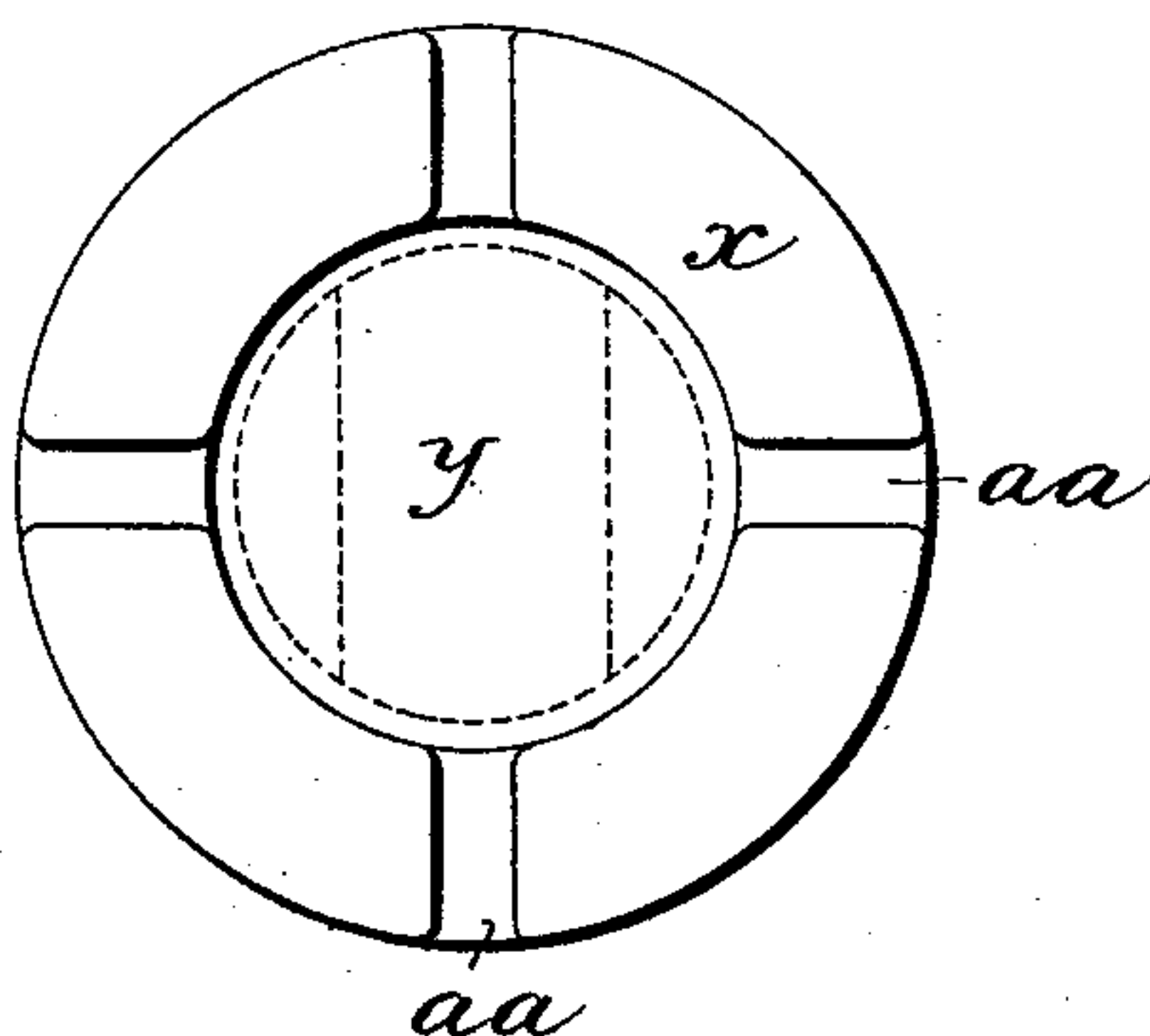
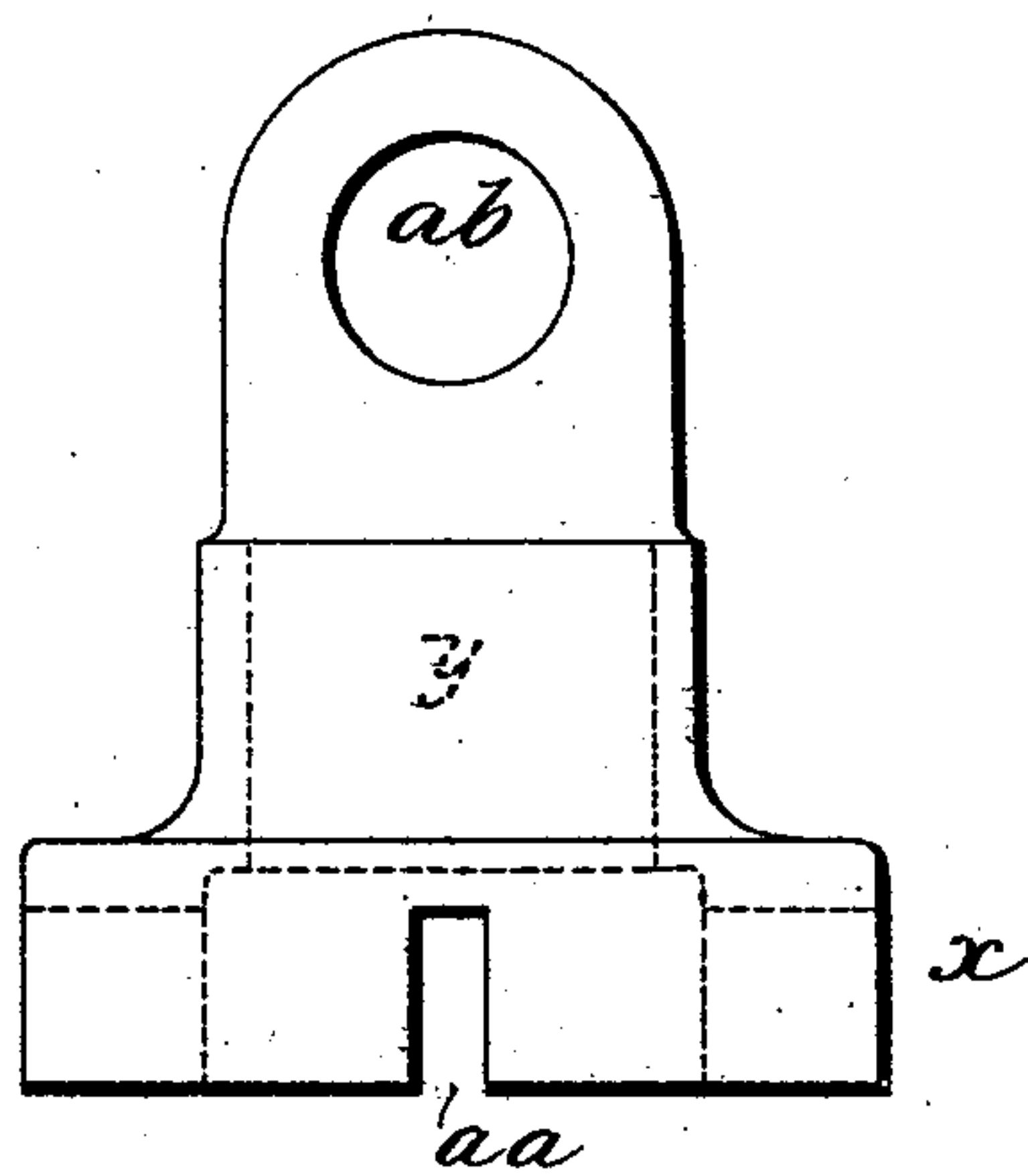


Fig. 17.



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UNITED STATES PATENT OFFICE.

HARREY MOORE, OF WELLINGBOROUGH, ENGLAND.

WHEEL FOR ROAD-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 529,077, dated November 13, 1894.

Application filed May 22, 1893. Serial No. 475,134. (No model.)

To all whom it may concern:

Be it known that I, HARREY MOORE, a subject of the Queen of Great Britain and Ireland, residing at Wellingborough, in the county of Northampton, England, have invented certain new and useful Improvements in Wheels for Road-Vehicles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention for improvements in wheels of road vehicles relates to that class of wheels in which means are provided in the hub for forcing the spokes outward toward the felly; and has for its object to provide an improved arrangement of mechanism for forcing the spokes outward toward the felly, improved arrangements for securing the wheel on the axle, and for oiling the axle.

In a wheel constructed according to this invention the inner end of each spoke is received in a loose shoe situated within the nave and having its inner surface forming a portion of a cone and a corresponding cone is fitted axially on the axle box so that it can be forced along the said box to force the shoe and with it the spoke outward. The inner ends of the shoes bear against an internal flange in the nave so as to prevent them being forced in with the expanding cone or their inner ends project beyond the spokes and slide in radial grooves in the said flange. The shoes are so shaped that in their innermost position they form together a full and complete ring coned interiorly and provided on its exterior with recesses to receive the ends of the spokes. The outer end of the cone is secured by radial arms to a ring fitting within the nave. The cone is screwed on the axle box and is operated by means of a head having a central recess to pass over the axle box, slots into which the radial arms are received, and a hole by which it can be rotated by a crow or other bar. The nave is formed with an internal recessed flange and the axle box provided with a corresponding external flange is inserted from the back of the nave, its flange taking into the recess in the internal flange of the nave. The axle box is prevented from rotating in the nave by a lug or other suitable means. The inner part of the tire

is channel shaped in cross section preferably with the sides inclined outward and is rolled or cast endless without weld or joint of any kind. The outer part may be formed to receive a rubber or other tire.

The axle box is secured on the axle by means of studs or bolts screwed or otherwise fixed in the inner flange of the axle box and to which is secured by nuts the back plate and the leather washer bearing on the inside of the collar on the axle.

In a modification the nave of the wheel is secured on the axle by means of an oil box placed on the inside of the collar on the axle and screwing into the nave, the whole being further secured by a lock nut screwing on the axle and bearing against the inner end of the oil box. The oil box and lock nut are placed on the axle before the two parts are welded together. The bearing surface of the axle box is formed with right and left spiral grooves so as to thoroughly distribute the oil.

In the accompanying sheet of drawings Figure 1 is a longitudinal section of a hub of a wheel constructed according to this invention. Fig. 2 is a similar view to Fig. 1 showing the parts in the position they occupy before the spokes are expanded or forced outward. Figs. 3 and 4 are cross sections corresponding respectively to Figs. 1 and 2. Fig. 5 is an elevation of the nave also showing in section, a modified arrangement of securing the axle box on the axle. Figs. 6 and 7 are respectively side and end elevations of the cone for forcing the wedges outward against the ends of the spokes. Figs. 8, 9, and 10 are details of the wedges for forcing the spokes outward. Figs. 11, 12, and 13, and Figs. 14, 15, and 16, are similar views to Figs. 8, 9, and 10 showing two slight modifications of the wedges. Figs. 17 and 18 are respectively side and end elevations of a key for operating the expanding cone.

The nave *a* of the wheel is provided with the usual mortices *b* to receive the ends of the spokes *c*, and with an internal rib *d* at the back of the mortices *b*, and with an internal recessed flange *e*. The axle box *f* is provided with a flange *g* corresponding to and taking into the recess of the flange *e* of the nave and is prevented from rotating in the nave by the pin *h*. The axle *i* is formed with a shoulder *l*

and with a collar *m*; and a cylindrical box *n*, leather washer *o*, and lock nut *p* are slipped on the axle at the back of the collar before the two parts are welded together. The box *n* which
 5 also serves as an oil box screws into the end of the nave and draws the end of the axle box against the shoulder *l* so that the whole is firmly secured on the axle and is locked by
 10 means of the nut *p*, the thread on the axle being tapered so that the nut is perfectly tight when in position and being left handed. The inner end of each spoke *c* is formed with a tenon *r* which is received in a separate and
 15 loose shoe *s* situated within the nave *a* and having its inner surface forming a portion of a cone. The loose shoes *s* corresponding thus in number to the number of the spokes are inserted into the nave with their inner ends bearing
 20 against the rib *d* and so that the recess in each shoe is opposite a mortise *b* in the nave. In this position the shoes together form a full and complete ring coned interiorly and provided
 25 on its exterior with recesses opposite to the mortises *b*. A male cone *t* corresponding to the cone of the shoes is screwed on the axle and is provided with a head consisting of the ring *u* fitting into the end of the nave and secured
 30 to the cone by radial arms *v*, the whole preferably being formed in one piece. The cone *t* is operated by means of the head *x* having a central recess *y* to pass over the end of the axle box, slots *a a* into which the radial
 35 arms *v* are received and a hole *a b* by which it can be rotated by a crow or other bar. The shoes *s* are forced outward to expand the spokes by screwing the cone *t* along the axle when the ring of shoes *s* opens out,
 40 each shoe being forced outward and forcing its spoke toward the felly. The rib *d* forms a stop for the shoes *s* and prevents them being moved farther inward with the male cone *t*. The cone *t* is secured by a lock nut *a c*
 45 screwing on the end of the axle box. Preferably the cone *t* has a right handed thread and the lock nut *a c* a left handed thread.
 In the modified shoe shown in Figs. 11, 12 and 13 the shoe is formed with a tail *a d* sliding in a slot *a e* in the rib *d* and Figs. 14, 15, and 16 show a modified shape of shoe.
 50 In the modified arrangements for securing the wheel on the axle shown in Fig. 5 the flange *g* on the inner end of the axle box *f* is provided with studs *a f* or bolts *a g* fixed therein and the whole is secured on the axle by
 55 means of the nuts *a h* and washer plate *a k* which is divided across its center to enable it to be put in position or it may be placed on the axle before the two ends are welded together. *o* is a leather washer. *a i* is an oil re-

ceiver box, and *a l* forms the end of the hub 60 and protects the box *a i*. The axle box *f* is provided with a right hand spiral groove *a m* and a left-hand spiral groove *a n* so as to thoroughly distribute the oil.

What I claim, and desire to secure by Letters Patent, is—

1. In a wheel, the combination, with the nave provided with mortises, a rib *d* behind the mortises, and a flange *e* near one end; of the spokes slidable in the mortises, and provided 70 with wedge-shaped end shoes bearing against the rib *d*; an axle provided with a shoulder *l* at one end of its bearing; an axle box journaled on the axle, bearing against the said shoulder, and provided with a flange *g* operatively secured to the flange *e*; and a cone 75 screwed upon the axle box and operating to force the said shoes and spokes outward, substantially as set forth.

2. In a wheel, the combination, with the 80 nave provided with mortises, a rib *d* behind the mortises, and a flange *e* near one end; of the spokes slidable in the mortises, and provided with wedge-shaped end shoes bearing against the rib *d*; an axle provided with the shoulder 85 *l* and the collar *m* at one end of its bearing; an axle box journaled on the axle bearing and provided with a flange *g*; an oil box *n* screwed into one end of the nave, engaging with the collar *m*, and securing the flanges *g* 90 and *e* together; and an adjustable cone screwed on the axle box and operating to force the said shoes and spokes outward, substantially as set forth.

3. In a wheel, the combination, with the 95 nave provided with mortises, and the flange *e* near one end; of the spokes slidable in the mortises and provided with wedge-shaped end shoes; an axle provided with oil grooves, and the shoulder *l* and collar *m* at one end of its 100 bearing; an axle box journaled on the axle bearing, and provided with the flange *g*; an oil box *n* screwed into one end of the nave, engaging with the collar *m*, and securing the flanges *g* and *e* together; an oil catch box se- 105 cured to the outer end of the axle box; a cylindrical end piece secured to the end of the nave and inclosing the said catch box; and an adjustable cone screwed on the axle box and operating to force the said shoes and 110 spokes outward, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

HARREY MOORE.

Witnesses:

JOHN FRANCIS GAIRNS,
 THOMAS LAKE.